AP/2878 IFW

PATENT APPLICATION

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE
BEFORE THE BOARD OF PATENT APPEALS AND INTERFERENCES

In re application of

FUJIEDA, ICHIRO, et al.

Appln. No.: 08/932,238

Confirmation No.: 5110

Filed: September 17, 1997

Docket No: Q46789

Group Art Unit: 2878

Examiner: Q. Le

For: IMAGE SENSOR DEVICE USING THIN FILM LIGHT SOURCE ARRANGED BETWEEN LIGHT RECEIVING ELEMENTS AND IMAGE TO BE SENSED

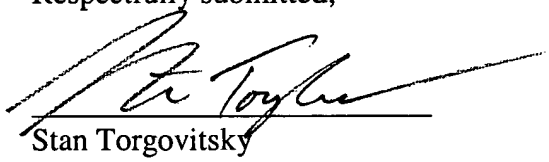
SUBMISSION OF APPELLANT'S BRIEF ON APPEAL

MAIL STOP APPEAL BRIEF - PATENTS
Commissioner for Patents
P.O. Box 1450
Alexandria, VA 22313-1450

Sir:

Submitted herewith please find an original and two copies of Appellant's Brief on Appeal. A check for the statutory fee of $330.00 is attached. The USPTO is directed and authorized to charge all required fees, except for the Issue Fee and the Publication Fee, to Deposit Account No. 19-4880. Please also credit any overpayments to said Deposit Account. A duplicate copy of this paper is attached.

Respectfully submitted,



Stan Torgovitsky
Registration No. 43,958

SUGHRUE MION, PLLC
Telephone: (202) 293-7060
Facsimile: (202) 293-7860

WASHINGTON OFFICE
23373
CUSTOMER NUMBER

Date: June 10, 2004

PATENT APPLICATION

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE
BEFORE THE BOARD OF PATENT APPEALS AND INTERFERENCES

In re application of

FUJIEDA, ICHIRO, et al.

Appln. No.: 08/932,238

Confirmation No.: 5110

Filed: September 17, 1997

Docket No: Q46789

Group Art Unit: 2878

Examiner: Q. Le

For: IMAGE SENSOR DEVICE USING THIN FILM LIGHT SOURCE ARRANGED BETWEEN LIGHT RECEIVING ELEMENTS AND IMAGE TO BE SENSED

APPELLANT'S BRIEF ON APPEAL UNDER 37 C.F.R. § 1.192

MAIL STOP APPEAL BRIEF - PATENTS
Commissioner for Patents
P.O. Box 1450
Alexandria, VA 22313-1450

Sir:

In accordance with the provisions of 37 C.F.R. § 1.192, Appellant submits the following:

This is an Appeal from the Final Rejection of November 10, 2003 (Paper No. 30) of Claims 1-6 and 43-52.

Three copies of this Brief are enclosed.

I. REAL PARTY IN INTEREST

Appellant respectfully submits that the above-captioned application is assigned in its entirety to NEC CORPORATION, a company organized under the laws of Japan.

II. RELATED APPEALS AND INTERFERENCES

Appellant states that, upon information and belief, Appellant is not aware of any co-pending appeal or interference which will directly affect or be directly affected by or have a bearing on the Board's decision in the pending appeal.

Appellant notes that the above-identified application has been considered on appeal (Appeal No. 2001-0390, Decision on Appeal mailed February 26, 20033) which Appellant believes to be relevant to the Board's decision in the pending appeal, as explained below.

III. STATUS OF CLAIMS

- The original application filed September 17, 1997 contained **claims 1-42**.
- On March 26, 1999, in response to Requirement to Elect Species (dated March 1, 1999), Appellant filed an Amendment and Response electing the Species illustrated in Figure 8B, and adding new independent **claim 43**. In the March 26, 1999 Amendment and Response, Appellants noted that:
    1. **claim 43** is generic to species illustrated in Figures 8B, 9B, 13, 16 and 17;
    2. **claims 1-12** are directed to species illustrated in Figures 8B, 9B, 13, 16 and 17, and therefore, claims 1-12 would be subject to examination in this application upon the allowance of claim 43; and
    3. **claims 1, 2 and 4**, readable on the species illustrated in Figure 8B, are subject to immediate examination as covering the elected species.
- On May 10, 1999, in the Office Action, Paper No. 9, the Examiner indicated that **claims 1-6 and 43** were subject to examination in this application.

- On August 6, 1999, Appellant filed an Amendment adding dependent **claims 44-51** and an independent **claim 52**.
- On March 8, 2000, Appellant filed an Amendment further amending **claims 1, 43, 46, 49 and 52**. This Amendment was entered upon filing of a Notice of Appeal, on May 12, 2000, and Brief on Appeal, on July 12, 2000.
- On April 24, 2003, in view of the Board's Decision on Appeal, mailed February 26, 2003, Appellant filed a CPA with a Preliminary Amendment further amending **claims 1, 43 and 52**.
- On August 23, 2003, Appellant filed an Amendment further amending **claims 1, 43 and 52** and canceling the non-elected **claims 7-42** without prejudice or disclaimer.

Claims 1-6 and 43-52, as set forth in the attached Appendix, are all the claims under consideration in the application, and stand finally rejected.

IV. STATUS OF AMENDMENTS

All of Appellant's Amendments, as noted in part III above, have been entered.

V. SUMMARY OF THE INVENTION

As explained in Appellant's previous Brief on Appeal filed on July 12, 2000, the present invention relates to image sensor devices which can be installed in an image input device such as a facsimile or a hand-held scanner.

A conventional image sensor device, as illustrated, for example in Appellant's Fig. 1, "consists of an optical fiber collection member 1202 composed of a plurality of bundled optical

fibers 1202; an illumination unit 1204 utilizing electroluminescence (EL); photoelectric conversion element 1203 utilizing a thin film semiconductor such as amorphous silicon (a-Si); and a light blocking unit 1205. ...[T]he photoelectric conversion elements 1203 of such structure are sequentially arranged ... [and the] number of the photoelectric conversion elements ranges from several hundred to several thousand. ... Light emitted uniformly from the illumination unit 1204 travels through the optical fibers 1202 to reach a document 1290. The reflected light from the document 1290 partially travels through the inside of the document and a small gap between the document and the optical collection member 1201, and passes through the inside of the optical fiber 1202. This reflected light is detected by the photoelectric conversion element 1203. ... If the light from the illumination unit 1204 is incident on the photoelectric conversion [element] 1203, contrast of the image read out form the document is deteriorated. This is prevented by the light blocking unit 1205 which prevents light from being directly incident on the photoelectric conversion element 1203" (Appellant's specification, page 2, line 1 - page 3, line 8; see also Appellant's Figure 2 and Appellant's specification, page 3, lines 2-17).

In another example of a conventional image sensor (see Appellant's Figure 3), which does not use an optical fiber collection element, "a sensor section 1410 and an illumination section 1420 are formed in parallel on a glass substrate 1401 ... . The sensor section 1410 is constituted by arranging an a-Si layer 1403 between a bottom electrode 1402 and a transparent electrode 1404 and the illumination section 1420 is constituted by arranging an electrode 1405 and a transparent electrode 1407. ... Light emitted from the illumination section 1420 toward a

document 1490 passes through a protection layer 1408 to irradiate the document 1490. The reflected light from the document 1490 is partially detected by the sensor section 1410, thereby obtaining brightness information of the document 1490" (Appellant's specification, page 5, lines 2 - 18; see also Appellant's Figure 4 and Appellant's specification, page 6, line 3 - page 7, line 3).

In all of the conventional image sensor devices, the light emission portions where the light originates are not aligned with, and do not overlap, the light receiving elements (see, for example, Appellant's Figures 5, 6A and 6B illustrating the relative position of light emission portions where the light (illustrated by "arrows") originates and photoelectric conversion element 1612). That is, the light emission portions where the light originates are those portions of light source 1620 where light emission layer 1623 is formed between transparent electrode 1622 and opaque electrode 1624. Since (1) "the portion in the document facing the light emission section of the thin film light source is illuminated most strongly", (2) "the light reflected from the document is in general diffused", and (3) "the light reflected toward the photoelectric conversion element is alone detected", in conventional image sensor devices "the reflected light from the place [on the document] facing the illumination section [i.e., the light emission section] capable of performing illumination with most effectiveness can not be utilized [and] a large majority of emitted light is wasted" (see Appellant's specification, page 11, lines 1-14). Thus, conventional image sensor devices suffer the drawbacks of (1) requiring increased power for consumption by

the light emission sections, and/or (2) requiring increased size for accommodating widened light emission sections (see Appellant's specification, page 11, lines 14-26).

Appellant's invention overcomes the above-noted drawbacks of conventional image sensor devices by providing image sensor devices having unique combinations of features including, *inter alia*, light emission portions, which emit light to a document, arranged such that (1) at least one of the light emission portions where the light originates is substantially aligned with a corresponding light receiving element, or (2) at least one of the light emission portions where the light originates and a light receiving element, which corresponding to the light emission portion where the light originates, substantially overlap.

An example of an image sensor device in accordance with Appellant's claimed invention is illustrated in Appellant's Figures 7, 8A and 8B which show different views of the same image sensor device (see Appellant's specification, page 18, lines 6-16). In particular, "[a]s shown in Fig. 8A, the thin film light source 120 and the image sensor 110 are stacked interposed by an adhesive layer 130 so as to dispose the light emission layer 123 at the center of the photoelectric conversion element 112. ... The portion of the light emission layer 123 between the transparent electrode 122 and the opaque electrode 124 alone emits light. Specifically, as shown in Fig. 8B, in this embodiment, the light emission portion for the thin film light source 120 is limited to the place facing the center of the photoelectric conversion element 112. The light emitted from these light emission portions passes through the transparent substrate 121 to illuminate limitedly the portion of the document 190 closest to the corresponding photoelectric conversion element 112 corresponding

to this light emission portion .... [Therefore,] the portion of the document which is illuminated most strongly almost agrees with the portion of the document 190 facing the photoelectric conversion element 112. ... [Furthermore,] the portion of the document to be readout is limitedly illuminated, whereby the photoelectric conversion devise disposed closest to that portion can detect the reflected light effectively. Therefore, ... it will be possible to read out the image with a high resolution. Moreover, since the probability of incidence of the reflected light onto the photoelectric conversion element is high, the quality of light emission of the light source can be reduced and the power consumption can be suppressed to be little." (See Appellant's specification, page 21, line 6 - page 23, line 15).

VI. ISSUES

1. Whether claims 1, 3, 43-46, 48-50 and 52 are anticipated by Appellant's admitted prior art within the meaning of 35 U.S.C. §102(e).

2. Whether claims 1, 3, 43-46, 48-50 and 52 are anticipated by Funada et al. within the meaning of 35 U.S.C. §102(e).

3. Whether claims 2, 4-6, 47 and 51 would have been obvious within the meaning of 35 U.S.C. §103(a) from Appellant's admitted prior art.

4. Whether claims 2, 4-6, 47 and 51 would have been obvious within the meaning of 35 U.S.C. §103(a) from Funada et al.

VII. GROUPING OF CLAIMS

It is noted that independent claims 1, 43 and 52, do not stand or fall together, and that the dependent claim 45 does not stand or fall together with its independent base claim 1, but recite separately patentable features as explained below in Section VIII. Dependent claims 2-6, 44, 46 and 47 stand or fall together with their base claim 1. Dependent claims 48-51 stand or fall together with their base claim 43.

VIII. ARGUMENTS

1. Claims 1, 3, 43-46, 48-50 and 52 are not anticipated by Appellant's admitted prior art within the meaning of 35 U.S.C. §102(e).

In the Decision on Appeal, mailed February 26, 2003 ("the Decision"), the Board of Patent Appeals and Interferences affirmed the Examiner's 35 U.S.C. §§ 102(e) and 103(a) rejections of claims 1-6 and 43-52 as set forth in the Examiner's Answer, mailed May 13, 2002.

In the Decision, the Board notes that "Appellants' argument [for distinguishing the invention from the prior art] is based on the fact that in their invention, the points where light originates are aligned with respective light receiving elements whereas, this is not true of the admitted prior art" (Id., page 6). The Board further notes that, as recited in independent claim 1 (and, likewise, in independent claims 43 and 52), the definition of "light source" may be broadly construed so as to make claims 1, 43 and 52 readable on admitted prior art.

In view of the Boards analysis, Appellant's amend independent claims 1, 43 and 52 explicitly to recite that it is at least one of the light emission portions where the light originates that is substantially aligned with a corresponding light receiving element (claims 1 and 43), and that it is at least one of the light emission portions where the light originates and a light receiving element corresponding to the at least one of the light emission portions that substantially overlap (claim 52).

However, the Examiner maintains that Appellant's admitted prior art as illustrated in Appellant's Figures 1-6B discloses every feature of Appellant's invention as recited in claims 1, 3, 43-46, 48-50 and 52.

As noted above, one of the features of Appellant's claimed invention is "at least one of said light emission portions where said light originates being substantially aligned with a corresponding light receiving element" (independent base claim 1; see also independent base claim 43). On the other hand, Appellant's independent claim 52 requires that "at least one of said light emission portions where said light originates and a light receiving element corresponding to said at least one of said light emission portions substantially overlap" (claim 52).

In contradistinction to Appellants' claimed invention, in the prior art devices illustrated in Appellant's Figures 1-6B light emission portions where the light originates are not substantially aligned with (in contradistinction to claims 1 and 43), and do not substantially overlap (in contradistinction to claim 52), their corresponding light receiving elements. The Examiner

focuses on Appellant's admitted prior art as illustrated in Figs. 5-6B (see Office Action Paper No. 30, page 3), alleging that:

(1) thin film light source 1620 "includes a transparent electrode (1622), a light emission layer (1623), a plurality of light emission windows or light emission portions (1625)",

(2) "opaque electrode includes a plurality of openings forming light emission portions and light blocking portions", and

(3) "at least one of the light emission portions where the light originates is substantially aligned and/or overlapped with the corresponding light receiving element" (see Id., emphasis in original).

That is, the Examiner's rejection is based on a theory that windows 1625 formed in opaque electrode 1624 (as shown in Appellant's Figs. 5-6B) are "light emission portions where the light originates", as recited in independent claims 1, 43 and 52. Appellant respectfully submits that the Examiner's theory is contrary Appellant's actual disclosure, and finds no basis in the general knowledge of artisans of ordinary skill in the art of thin film light sources.

As shown in Appellants' Fig. 6A,

> Light emitted from the light emission layer 1623 passes through the transparent substrate 1621 to illuminate a document 1690. The reflected light from the document 1690 partially passes through the transparent substrate 1621 and the opening potion 1625 and is detected by the photoelectric conversion element 1612 ... (Appellant's specification, page 9, lines 11-17; see Appellant's Figure 6A).

Clearly, opening portion 1625 is not a "light emission portions where the light originates", but is simply an "openings" for passing the light reflected from the document. Appellant respectfully submits that one of ordinary skill in the art of thin film light sources would readily appreciate that the only portions of thin film light source 1620 where the light originates are those portions where light emission layer 1623 is formed between transparent electrode 1622 and opaque electrode 1624 (as clearly illustrated in Appellant's Figs. 5 and 6A).

In summary, in Appellant's specification, element 1625 is not an "opaque electrode" where the light originates, as alleged by the Examiner (see Office Action, page 5), but is one of "opening portions 1625" formed in the opaque electrode 1624 (see Appellant's specification, page 8, lines 7-10). Opening portions 1625 are aligned with respective photoelectric conversion elements 1612. However, as clearly shown in Appellant's Fig. 6A, light does not originate from opening portions 1625. Instead, light originates only from areas where light emission layer 1623 is formed between the transparent electrode 1622 and opaque electrode 1624, and these areas are not substantially aligned with, and do not substantially overlap, respective photoelectric conversion elements 1612.

Accordingly, independent base claims 1 and 43 (as well the dependent claims 3, 43-46 and 48-50 which more specifically define the features recited in their respective base claims) and independent claim 52 are not anticipated by (i.e., are not readable on) Appellant's admitted prior at least for the reasons noted above.

Furthermore, Appellant's dependent claim 45 recites an arrangement where each of the light emission portions has an area smaller than an area of a corresponding light receiving element. In contradistinction to claim 45, Appellant's prior art Figs. 5-6B (cited by the Examiner) clearly show an arrangement where the area of light emission portion (defined by the area where elements 1622, 1623 and 1621 overlap) is larger than the area of corresponding light receiving elements 1612. Thus, Appellant's dependent claim 45 is patentable over Appellant's admitted prior art for this additional reason.

2. Claims 1, 3, 43-46, 48-50 and 52 are not anticipated by Funada et al. within the meaning of 35 U.S.C. §102(e).

The Examiner maintains that Funada et al. (Funada) discloses every feature of Appellant's invention as recited in claims 1, 3, 43-46, 48-50 and 52. In particular, the Examiner cites Funada's Figs. 9 and 11, and alleges that these figures illustrate an image reading device where "the light emission portions (243) with the light emission area (245) where the light originates is substantially aligned and/or overlapped with respect to the corresponding light receiving elements" (see Office Action, Paper No. 30, pages 2 and 3).

As in the case of Appellant's admitted prior art, the Examiner's theory is based on an erroneous conclusion of what constitutes a light emission are where the light originates. In fact, contrary to the Examiner's analysis, Funada's element 245 is not a "light emission area" where

the light originates, but is one of "light transmissive windows 245" formed in opaque electrode 244 (see Funada, col. 11, line 54 through col. 12, line 45). Light transmissive windows 245 are aligned with respective light receiving portions (i.e., electrodes 121). Thus, Funada's Figs. 9 and 11 illustrate an arrangement analogous to the arrangement illustrated in Appellant's Figs. 6A and 6B. That is, as in Appellant's Fig. 6A, in Funada's Fig. 9 (see also Funada's Fig. 4), light originates only from those areas where light emitting layer 243 (203 in Fig. 4) is sandwiched between transparent electrodes 241 (201 in Fig. 4) and opaque electrodes 244 (205 in Fig. 4), and these areas are not substantially aligned with respective electrodes 121 (see Funada, col. 2, lines 56-67; col. 6, lines 28-61; and col. 12, lines 27-45).

Therefore, like Appellant's admitted prior art, Funada does not disclose, or suggest, at least the feature of a light emission portion where the light originates being substantially aligned with its corresponding light receiving element, as recited in Appellant's independent base claims 1 and 43. Likewise, like Appellant's admitted prior art, Funada does not disclose or even suggest an image sensor device wherein at least one light emission portion where the light originates and its corresponding light receiving element substantially overlap, as recited in Appellants' independent claim 52. Therefore, independent base claims 1 and 43 (as well the dependent claims 3, 43-46 and 48-50 which more specifically define the features recited in their respective base claims) and independent claim 52 are not anticipated by (i.e., are not readable on) Funada.

Furthermore, as noted above, Appellant's dependent claim 45 recites an arrangement where each of the light emission portions has an area smaller than an area of a corresponding light receiving element. In contradistinction to claim 45, Funada's Figs. 9 and 11 (cited by the Examiner) clearly show an arrangement where the area of light emission portion (defined by the area where elements 244, 243 and 241 overlap) is larger than an area of corresponding light receiving elements (defined by the areas where elements 121, 122 and 123 overlap). Thus, Appellant's dependent claim 45 is patentable over Funada for this additional reason.

3. Claims 2, 4-6, 47 and 51 would not have been obvious within the meaning of 35 U.S.C. §103(a) from Appellants' admitted prior art.

Appellant's dependent claims 2, 4-6, 47 and 51 incorporate all the novel and unobvious features of their respective base claims 1 and 43. Appellant's admitted prior art fails to teach or even suggest the features of Appellant's invention as recited in independent base claims 1 and 43 at least for the reasons set forth above (see part **1**). Therefore, dependent claims 2, 4-6, 47 and 51 would not have been obvious from Appellant's admitted prior art at least for the reasons set forth above (see part **1**) with regard to independent base claims 1 and 43.

4. Claims 2, 4-6, 47 and 51 would not have been obvious within the meaning of 35 U.S.C. §103(a) from Funada et al.

Dependent claims 2, 4-6, 47 and 51 incorporate all the novel and unobvious features of their respective base claims 1 and 43. Funada fails to teach or even suggest the features of Appellant's invention as recited in independent base claims 1 and 43 at least for the reasons set forth above (see part **2**). Therefore, dependent claims 2, 4-6, 47 and 51 would not have been obvious from Funada at least for the reasons set forth above (see part **2**) with regard to independent base claims 1 and 43.

The present Brief on Appeal is being filed in triplicate. Unless a check is submitted herewith for the fee required under 37 C.F.R. §1.192(a) and 1.17(c), please charge said fee to Deposit Account No. 19-4880.

The USPTO is directed and authorized to charge all required fees, except for the Issue Fee and the Publication Fee, to Deposit Account No. 19-4880. Please also credit any overpayments to said Deposit Account.

Respectfully submitted,

Stan Torgovitsky
Registration No. 43,958

SUGHRUE MION, PLLC
Telephone: (202) 293-7060
Facsimile: (202) 293-7860

WASHINGTON OFFICE
23373
CUSTOMER NUMBER

Date: June 10, 2004

APPENDIX

CLAIMS 1-6 AND 43-52 ON APPEAL:

1. An image sensor device which optically reads out a document comprising:

an image sensor portion having a plurality of light receiving elements facing a document to be read out; and

a thin film light source arranged on the document side of said image sensor portion, said thin film light source emitting light to said document,

wherein said thin film light source includes a plurality of light emission portions, each of said light emission portions emitting light to said document, and corresponding to each of said light receiving elements, said light emission portions including a light blocking layer on said light receiving elements side, and said light emission portions being arranged between said light receiving elements and said document, at least one of said light emission portions where said light originates being substantially aligned with a corresponding light receiving element.

2. The image sensor device according to claim 1, wherein each of the light emission portions of said thin film light source comprises a transparent electrode, an opaque electrode and an organic thin film held between the transparent and opaque electrodes and said opaque electrode is formed of a material which functions as a light blocking layer for a region other than said light receiving element of said image sensor section.

3. The image sensor device according to claim 1, further comprising light blocking means provided at a region other than said plurality of light receiving elements of said image sensor portion.

4. The image sensor device according to claim 1, wherein said image sensor portion includes image sensors formed on a crystalline silicon wafer or image sensors formed on a transparent substrate by thin film semiconductor processes.

5. The image sensor device according to claim 1, wherein said thin film light source emits light of a plurality of different colors.

6. The image sensor device according to claim 1, wherein an optical fiber collection member is provided between said thin film light source and said document.

43. An image sensor device which optically reads out a document comprising:

an image sensor portion having a plurality of light receiving elements; and

a thin film light source arranged on a document side of said image sensor portion, said thin film light source emitting light to said document,

wherein light emission portions of said thin film light source emit light to said document, and are arranged in one-to-one correspondence to each of said light receiving elements,

said light emission portions include a light blocking layer on a side facing said light receiving elements and are arranged between said light receiving elements and said document, and

at least one of said light emission portions where said light originates is substantially aligned with a corresponding light receiving element.

44. The image sensor device according to claim 1, wherein each of said light emission portions is substantially centered with respect to said corresponding light receiving element.

45. The image sensor device according to claim 1, wherein each of said light emission portions has an area smaller than an area of a corresponding light receiving element of said plurality of light receiving elements.

46. The image sensor device according to claim 1, wherein substantially all surface area of said at least one of said light emission portions is between said corresponding light receiving element and said document.

47. The image sensor device according to claim 2, wherein said organic thin film comprises a plurality of individual and separate organic thin film areas, each of said organic thin film areas held between the transparent and opaque electrodes.

48. The image sensor device according to claim 43, wherein said at least one of said light emission portions is substantially centered with respect to said corresponding light receiving element.

49. The image sensor device according to claim 43, wherein substantially all surface area of said at least one of said light emission portions is between said corresponding light receiving element and said document.

50. The image sensor device according to claim 43, wherein each of said light emission portions is substantially centered with respect to a corresponding light receiving element of said plurality of light receiving elements.

51. The image sensor device according to claim 43, wherein each of the light emission portions comprises a transparent electrode, an opaque electrode and an organic thin film, said organic thin film further comprising a plurality of individual and separate organic thin film areas each of said organic thin film areas held between the transparent and opaque electrodes, and said opaque electrode is formed of a material which functions as a light blocking layer for a region other than said light receiving element of said image sensor section.

52. An image sensor device which optically reads out a document comprising:

an image sensor portion having a plurality of light receiving elements; and

a thin film light source arranged on a document side of said image sensor portion, said thin film light source emitting light to said document,

wherein light emission portions of said thin film light source are arranged in one-to-one correspondence to each of said light receiving elements,

said light emission portions emit light to said document, include a light blocking layer on a side facing said light receiving elements, and are arranged between said light receiving elements and said document, and

at least one of said light emission portions where said light originates and a light receiving element corresponding to said at least one of said light emission portions substantially overlap.